What Is Claimed Is:

1   1.   A method for redirecting external memory allocation operations,

2   generated during calls by an application to external library functions, to an

3   internal memory manager within the application, comprising:

4   encountering a call to an external library function during execution of the

5   application;

6   determining if the external library function can call to an internal memory

7   allocation function within the application; and

8   if so, redirecting the call to the internal memory allocation function.

1   2.   The method of claim 1, wherein the task of determining if the

2   external library function can call an internal memory allocation function involves

3   reading a pre-determined indicator value, which indicates whether the external

4   library function can call the internal memory allocation function.

1   3.   The method of claim 2, further comprising pre-determining a value

2   for the pre-determined indicator value by examining the external library function

3   to determine whether the external library function or a function called by the

4   external library function will call a memory allocation function, and whether there

5   are problematic references to external memory blocks allocated by the external

6   library function.

1   4.   The method of claim 1, wherein the application is a platform-

2   independent virtual machine.

10

Attorney Docket No. SUN-P9039-EKL   Inventors: Mathiske et al.

DMG H:\SUN MICROSYSTEMS\SUN-P9039-EKL\SUN-P9039-EKL APPLICATION.DOC

1   5.   The method of claim 1, wherein the application runs in single-

2   threaded mode on a computing device.

1   6.   The method of claim 1, wherein the application runs on a memory-

2   constrained computing device.

1   7.   The method of claim 1, wherein redirecting the call to the internal

2   memory allocation function involves executing an interpose function that calls the

3   internal memory allocation function.

1   8.   The method of claim 1, further comprising periodically garbage

2   collecting the memory allocated by the internal memory allocation function.

1   9.   The method of claim 1, wherein the internal memory allocation

2   function allocates memory in a heap.

1   10.   A computer-readable storage medium storing instructions that

2   when executed by a computer cause the computer to perform a method for

3   redirecting external memory allocation operations, generated during calls by an

4   application to external library functions, to an internal memory manager within

5   the application, the method comprising:

6   encountering a call to an external library function during execution of the

7   application;

8   determining if the external library function can call to an internal memory

9   allocation function within the application; and

10   if so, redirecting the call to the internal memory allocation function.

11

Attorney Docket No. SUN-P9039-EKL   Inventors: Mathiske et al.

DMG H:\SUN MICROSYSTEMS\SUN-P9039-EKL\SUN-P9039-EKL APPLICATION.DOC

1   11.   The computer-readable storage medium of claim 10, wherein the
2 task of determining if the external library function can call an internal memory
3 allocation function involves reading a pre-determined indicator value, which
4 indicates whether the external library function can call the internal memory
5 allocation function.

1   12.   The computer-readable storage medium of claim 11, wherein the
2 method further comprises pre-determining a value for the pre-determined
3 indicator value by examining the external library function to determine whether
4 the external library function or a function called by the external library function
5 will call a memory allocation function, and whether there are problematic
6 references between external memory blocks allocated by the external library
7 function.

1   13.   The computer-readable storage medium of claim 10, wherein the
2 application is a platform-independent virtual machine.

1   14.   The computer-readable storage medium of claim 10, wherein the
2 application runs in single-threaded mode on a computing device.

1   15.   The computer-readable storage medium of claim 10, wherein the
2 application runs on a memory-constrained computing device.

1   16.   The computer-readable storage medium of claim 10, wherein
2 redirecting the call to the internal memory allocation function involves executing
3 an interpose function that calls the internal memory allocation functions.

12

1   17.   The computer-readable storage medium of claim 10, wherein the
2 method further comprises periodically garbage collecting the memory allocated by
3 the internal memory allocation function.

1   18.   The computer-readable storage medium of claim 10, wherein the
2 internal memory allocation function allocates memory in a heap.

1   19.   An apparatus for redirecting external memory allocation
2 operations, generated during calls by an application to external library functions,
3 to an internal memory manager within the application, comprising:
4   an execution mechanism configured to execute a call to an external library
5 function during execution of the application;
6   a determination mechanism configured to determine if the external library
7 function can call to an internal memory allocation function within the application;
8 and
9   a redirection mechanism configured to redirect the call to the internal
10 memory allocation function.

1   20.   The apparatus of claim 19, wherein the determination mechanism
2 is further configured to read a pre-determined indicator value, which indicates
3 whether the external library function can call the internal memory allocation
4 function.

1   21.   The apparatus of claim 20, further comprising a precomputation
2 mechanism configured to precompute the pre-determined indicator value by
3 examining the external library function to determine whether the external library
4 function or a function called by the external library function will call a memory

13

5   allocation function, and whether there are problematic references to external

6   memory blocks allocated by the external library function.

1   22.   The apparatus of claim 19, wherein the application is a platform-

2   independent virtual machine.

1   23.   The apparatus of claim 19, wherein the application runs in single-

2   threaded mode on a computing device.

1   24.   The apparatus of claim 19, wherein the application runs on a

2   memory-constrained computing device.

1   25.   The apparatus of claim 19, wherein the redirection mechanism is

2   further configured to execute an interpose function that calls the internal memory

3   allocation functions.

1   26.   The apparatus of claim 19, further comprising a garbage collection

2   mechanism configured to periodically garbage collect the memory allocated by the

3   internal memory allocation function.

1   27.   The apparatus of claim 19, wherein the internal memory allocation

2   function allocates memory in a heap.

14